WHAT IS CLAIMED IS:

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1	1. A data coding method comprising:
2	accepting digital data for coding;
3	pseudo-chaotically coding the digital data by allocating the digital
4	data to a state sequence assigned according to a chaotic map;
5	converting the pseudo-chaotically coded data to analog form and
6	modulating the pseudo-chaotically coded data into synchronization frames.
1	2. The data coding method according to claim 1, wherein said
2	step of pseudo-chaotically coding comprises:
3	shifting the digital data in a shift register with a most recent bit of
4	information in a given clock cycle of shift register operation being assigned as a
5	least significant bit in the shift register and the oldest bit being discarded.
1	3. The data coding method according to claim 1, wherein said
2	step of pseudo-chaotically coding comprises assigning a state sequence according
3	to symbolic dynamics defined on the chaotic map, wherein a Markov partition
4	identifies symbolic states and transitions associated to the digital data.
1	4. The data coding method according to claim 1, wherein said
2	step of modulating comprises assigning a position of a pulse train within a
3	synchronization frame for each transmitted bit(s), the synchronization frame being
4	partitioned, according to symbolic dynamics defined on the chaotic map.
1	5. The data coding method according to claim 1, further
2	comprising a step of randomizing the digital data prior to said step of pseudo-
3	chaotically coding.
1	6. The data coding method according to claim 5, wherein said
2	step of randomizing comprises a step of compressing the digital data according to
3	a data compression algorithm.

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1	7. The data coding method according to claim 5, wherein said
2	step of randomizing comprises scrambling the data according to a scrambling
3	algorithm.
1	8. The data coding method according to claim 1, wherein said
2	step of modulating allows a guard interval between synchronization frames.
1	9. The data coding method according to claim 1, wherein said
2	step of pseudo-chaotically coding comprises steps of:
3	shifting the digital data into the shift register, wherein the shift
4	register operation approximates the dynamics of a Bernoulli shift map of the form
5	$X_{K+1} = 2X_K \mod (1)$, and
6	converting the shifted digital data according to a conversion of the
7	form $X_{K+1}=1 - 2 X_K - 0.5 $.
1	10. A data coding and decoding method, the method comprising
2	steps of:
3	accepting digital data for coding;
4	pseudo-chaotically coding the digital data by applying a chaotic map
5	having N states;
6	converting the pseudo-chaotically coded data to analog form;
7	modulating the pseudo-chaotically coded data to produce a
8	modulated signal;
9	transmitting the modulated signal over a channel;
10	receiving, at a receiver, a signal from the channel;
11	decoding the pseudo-chaotically coded data from the signal, the
12	decoding comprising Viterbi detection matched to the chaotic map with N or
13	fewer than N states.
1	11. The method according to claim 10,
2	wherein said step of pseudo-chaotically coding comprises assigning

a state sequence according to symbolic dynamics defined on the chaotic map,

4	wherein a Markov partition identifies the symbolic states and the transitions
5	associated to the input bits.
1	12. A data coding system comprising:
2	a pseudo-chaotic data encoder for pseudo-chaotically encoding
3	digital data, the pseudo-chaotic data encoder comprising a shift register for
4	shifting the digital data and a digital signal processor for translating shifted digital
5	data according to a selected chaotic map;
6	a digital to analog converter for converting the pseudo-chaotically
7	shifted and translated digital data;
8	a modulator for modulating output of the digital to analog converter
9	for transmission on a communication channel; and
10	a receiver for demodulating and decoding the pseudo-chaotically
11	coded data from the signal, the decoding comprising Viterbi detection matched to
12	the chaotic map with N or fewer than N states.
1	13. The data coding system according to claim 12, further
2	comprising an output mapper that reconstructs the transmitted message given the
3	estimated sequence of states provided by the detector.
1	14. The data coding method according to claim 12, further
2	comprising a step of randomizing the digital data prior to said step of pseudo-
3	chaotically encoding.
1	15. The data coding method according to claim 14, wherein said
2	step of randomizing comprises a step of compressing the digital data according to
3	a data compression algorithm.
1	16. The data coding method according to claim 14, wherein said
2	step of randomizing comprises scrambling the data according to a scrambling
3	algorithm.
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